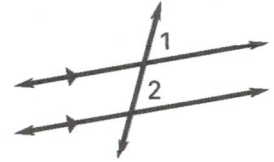


- Goals**
- Prove and use results about parallel lines and transversals.
  - Use properties of parallel lines to solve problems.

### POSTULATE 15: CORRESPONDING ANGLES POSTULATE

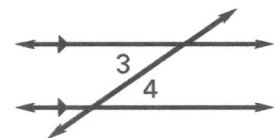
If two parallel lines are cut by a transversal, then the pairs of corresponding angles are \_\_\_\_\_.



$$\angle 1 \cong \angle 2$$

### THEOREM 3.4: ALTERNATE INTERIOR ANGLES

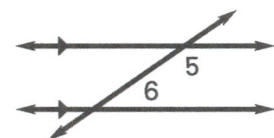
If two parallel lines are cut by a transversal, then the pairs of alternate interior angles are \_\_\_\_\_.



$$\angle 3 \cong \angle 4$$

### THEOREM 3.5: CONSECUTIVE INTERIOR ANGLES

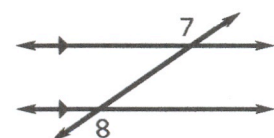
If two parallel lines are cut by a transversal, then the pairs of consecutive interior angles are \_\_\_\_\_.



$$m\angle 5 + m\angle 6 = 180^\circ$$

### THEOREM 3.6: ALTERNATE EXTERIOR ANGLES

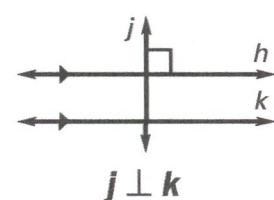
If two parallel lines are cut by a transversal, then the pairs of alternate exterior angles are \_\_\_\_\_.



$$\angle 7 \cong \angle 8$$

### THEOREM 3.7: PERPENDICULAR TRANSVERSAL

If a transversal is perpendicular to one of two parallel lines, then it is \_\_\_\_\_ to the other.



### Example 1 Using Properties of Parallel Lines

a.  $\angle 2$

b.  $\angle 3$

c.  $\angle 5$

d.  $\angle 4$



#### Solution

a.  $m\angle 2 = 180^\circ - m\angle \underline{\quad} = \underline{\quad}^\circ$

b.  $m\angle 3 = m\angle \underline{\quad} = \underline{\quad}^\circ$

c.  $m\angle 5 = m\angle \underline{\quad} = \underline{\quad}^\circ$

d.  $m\angle 4 = m\angle \underline{\quad} = \underline{\quad}^\circ$

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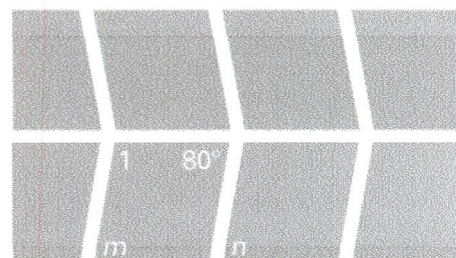
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### Example 2 Using Properties of Parallel Lines

**Parking Lot Design** In the diagram of the parking lot,  $m \parallel n$ . What is  $m\angle 1$ ?



#### Solution

$m\angle 1 + 80^\circ = \underline{\quad}^\circ$

$m\angle 1 = \underline{\quad}^\circ$

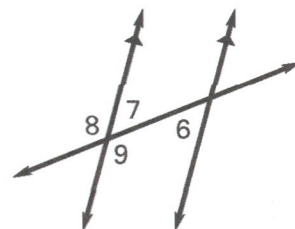
Property of Equality

✓ **Checkpoint** Given that  $m\angle 6 = 53^\circ$ , find the angle measure. Tell which postulate or theorem you use.

1.  $\angle 7$

2.  $\angle 8$

3.  $\angle 9$

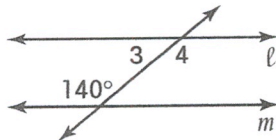


# Practice • Interior Angles

Lessons 4.5 and 4.6

In each diagram,  $\ell \parallel m$ . Find the measure of  $\angle 3$  and  $\angle 4$ .

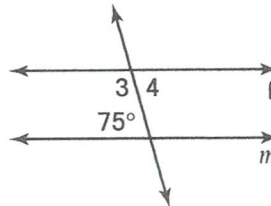
1.



$\angle 3$  is \_\_\_\_\_.

$\angle 4$  is \_\_\_\_\_.

2.

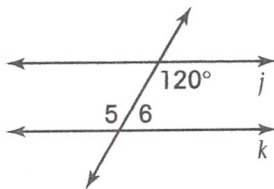


$\angle 3$  is \_\_\_\_\_.

$\angle 4$  is \_\_\_\_\_.

In each diagram,  $j \parallel k$ . Find the measure of  $\angle 5$  and  $\angle 6$ .

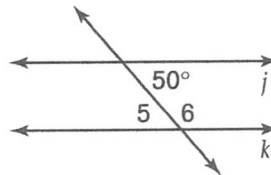
3.



$\angle 5$  is \_\_\_\_\_.

$\angle 6$  is \_\_\_\_\_.

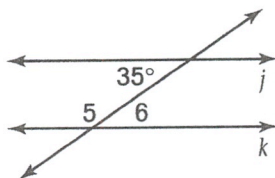
4.



$\angle 5$  is \_\_\_\_\_.

$\angle 6$  is \_\_\_\_\_.

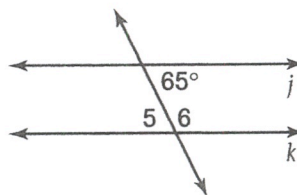
5.



$\angle 5$  is \_\_\_\_\_.

$\angle 6$  is \_\_\_\_\_.

6.

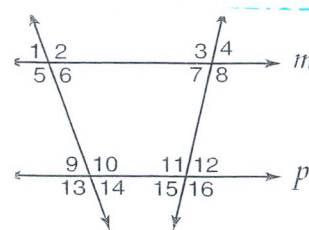


$\angle 5$  is \_\_\_\_\_.

$\angle 6$  is \_\_\_\_\_.

## Transversals and Corresponding Angles

In the figure,  $m \parallel p$ . Name all angles congruent to the given angle. Give a reason for each answer.



1.  $\angle 1$

2.  $\angle 7$

3.  $\angle 13$

4.  $\angle 8$

5.  $\angle 9$

6.  $\angle 16$

Find the measure of each numbered angle.

